REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated November 14, 2002 and the phone interview with the Examiner on March 12, 2002.

Claims 1, 3-5, 8, 10-19, 21-30 are under consideration in this application. Claims 1, 8, 18, 19, 21, 22, 26-28 are being amended, as set forth above and in the attached marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim applicants' invention. Claims 29-30 are being added to recited other embodiment described in the specification. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Formality Rejection

Claims 26 and 28 were rejected 35 U.S.C. § 112, second paragraph, for the recitation of "associating it with" and "IC". As indicated, the claims have been amended as required by the Examiner. Accordingly, the withdrawal of the outstanding informality rejection is in order, and is therefore respectfully solicited.

Prior Art Rejections

Claims 1, 3-5, 8, 10-19, 21-24, 26 and 27 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Pat. No. 6,284,459 to Nova et al. (hereinafter "Nova"), claims 1, 3, 4, 8, 13, 14, 17-19, 21-24, 26 and 27 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Pat. No. 5,968,728 to Perttunen et al. (hereinafter "Perttunen"), and claims 1, 5 and 8 have been rejected under 35 U.S.C. § 103 by U.S. Pat. No. 5,968,728 to Zeleny et al. (hereinafter "Zeleny") in view of Nova. These rejections have been carefully considered, but are most respectfully traversed.

The biochip according to the invention, as now recited in claim 1, comprises: a surface spotted with a plurality of biopolymers in a predetermined pattern of spot locations; and a storage medium stored with information of the biopolymers, wherein the storage medium stores information. The information comprises at least one spot location, identity of the biopolymers spotted on said spot location, and an amount of the biopolymers spotted on said spot location.

The invention, as now recited in claim 8, is directed to a method for using a biochip, comprising the steps of: (a) providing the biochip having a surface spotted with a plurality of biopolymers in a predetermined pattern of spot locations and a storage medium stored with information of the biopolymers, the information including at least one spot location, an identity of the biopolymers spotted on each of said spot location, and an amount of the biopolymers spotted on each of said spot location; (b) applying a sample to the biochip to hybridize the plurality of biopolymers with the sample; (c) detecting said spot location to determine an amount of biopolymers bound with the sample; and (d) storing on the storage medium of the biochip information of the amount of the biopolymers bound with the sample at said spot location.

The invention, as now recited in claim 26, is directed to a method of manufacturing a biochip, comprising the steps: spotting a plurality of biopolymers on a surface of the biochip in a predetermined pattern thereby providing spot locations thereon; and writing into a storage medium of the biochip information of the spot locations, identity of the biopolymers, and an amount of the biopolymers spotted on each of said spot locations.

Applicants respectfully contend that none of the cited prior art references or their combination as relied upon by the Examiner, teaches or suggests "storing on a storage medium of a biochip an amount of the biopolymers spotted on each spot location (claims 1 and 26; page 10, line 10; page 12, lines 15-20; page 12, lines 7-14) or an amount of the biopolymers bound with the sample corresponding to said spot location (claim 8; page 14, line 9)." The amount of spotted biopolymers (page 12, line 15-20) and the amount of biopolymers bound with the sample ("fluorescent-labeled sample DNA 82" page 13, lines 8-9 and last paragraph) can be obtained by detecting fluorescent intensity.

In contrast, Nova teaches "measuring the concentration of and number of available **binding sites** present on each matrix with memory particle or each microspot, which information is then encoded into each memory for each microspot or each particle (col. 9, line 50- col. 92, line 7), which is different from "storing an amount of the biopolymers spotted on each spot

location" according to the invention. The amount of aggregated "**binding sites**" of the biopolymers is different from the amount of biopolymers. As long as one of the biopolymers has more than one binding site thereon, the amount of aggregated "binding sites" of the biopolymers will be larger than the amount of biopolymers. In addition, when one kind of the biopolymers has different numbers of binding sites for different samples of interest, "the amount (A) of aggregated "binding sites" of the biopolymers corresponding to one kind of sample" is not applicable to another kind of sample such that it takes an additional step to convert the amount A into "the amount of the biopolymers" so as to calculate the amount (B) of aggregated "binding sites" of the biopolymers corresponding to another kind of sample. On the other hand, by storing the amount of biopolymers, the invention can directly calculate the amount (B) of aggregated "binding sites" of the biopolymers corresponding to another kind of sample without the above-mentioned converting step.

Applicant would like to point out that all the "amount" referenced in Nova is not stored in the memory. For example, an "amount of bound analyze" on col. 14, line 59, is merely quantified (col. 14, line 60) but not stored in the memory.

Perttunen's "mapping assigns each of the plurality of molecular receptors to a corresponding one of the plurality of sites" (col. 2, lines 52-54). This one-on-one mapping relationship fixes the amount of biopolymers on each site to be ONE such that it eliminates the need to "store an amount of the biopolymers spotted on each spot location" as according to the invention. The data 110 can encode an array (rather than "an amount") which indicates the [one and only one] molecular receptor at each site" (col. 7, lines 57-58).

As to Zeleny, it provides only a bar code to identify the kind of biopolymers but not the amount of the biopolymers. Applicant would like to point our that the rejection based upon Zeleny and Nova should be under 35 U.S.C. § 103 rather than § 102.

There is no teaching or suggestions for combining Zeleny with Nova as suggested by the Examiner, nor is there any teaching or suggestion for modifying "storing the amount of available binding sites" in Nova into "storing the amount of the spotted bioploymers" according to the invention. Any reliance upon the "common knowledge and common sense" of one skilled in the art for motivation to combine the teachings in Zeleny and Nova or for motivation to modify Nova as discussed must abide by the agency's obligation to cite references to support its conclusion with the specific teaching of allegations of "obviousness" or combination on the record to allow

accountability.

> *To establish a prima facie case of obviousness, the Board must, inter alia, show "some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). "The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved." Kotzab, 217 F.3d at 1370, 55 USPQ2d at 1317. .... Recently, in In re Lee, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002), we held that the Board's reliance on "common knowledge and common sense" did not fulfill the agency's obligation to cite references to support its conclusions. Id. at 1344, 61 USPQ2d at 1434. Instead, the Board must document its reasoning on the record to allow accountability. Id. at 1345, 61 USPQ2d at 1435.*
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> See In re Thrift, 298 F.3d 1357.

Applicants contend that none of the prior art references or their combination teaches or discloses each and every feature of the present invention as disclosed in independent claims 1, 8 and 26. As such, the present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the Office Action rely, Applicants respectfully contend that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the

above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

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Marked-up Version of Amended Claims

1. A biochip comprising:

a surface spotted with a plurality of biopolymers in a predetermined pattern of spot locations; and

a storage medium [for storing] stored with information of the biopolymers [to be spotted], wherein the storage medium stores information, said information comprising at least one spot location, identity of the biopolymers spotted on [each] said spot location, and [the] an amount of the biopolymers spotted on [each] said spot location.

8. A method for using a biochip, comprising the steps of:

(a) providing the biochip having a surface spotted with a plurality of biopolymers in a predetermined pattern of spot locations and a storage medium stored with information of the biopolymers, said information including at least one spot location, identity of the biopolymers spotted on said spot location, and an amount of the biopolymers spotted on said spot location;

(b) applying a sample to the biochip to hybridize[, wherein the biochip comprises a surface spotted with a] the plurality of biopolymers with the sample[in a predetermined pattern];

[(b)] (c) detecting [a] said spot location to determine an amount of biopolymers [where the sample has] bound with the sample[;

wherein the biochip comprises a storage medium, wherein the storage medium stores information comprising spot location, identity of the biopolymers spotted on each spot location, and the amount of biopolymers spotted on each spot location]; and

[(c)] (d) storing on the storage medium of the biochip [and displaying] information of the amount of the biopolymers [that has] bound with [a] the sample at said spot location [molecule by searching in the data stored in the storage medium based on the spot location bound with a sample molecule].

18. The biochip of claim 1, wherein each of the plurality of biopolymers comprises a DNA molecule.

19. The biochip of claim 1, wherein each of the plurality of biopolymers comprises a protein molecule.

21. The method of claim 8, wherein each of the plurality of biopolymers comprises a DNA molecule.

22. The method of claim 8, wherein each of the plurality of biopolymers comprises a protein molecule.

26. A method of manufacturing a biochip [according to claim 1], comprising the steps:

spotting a plurality of biopolymers on a surface of the biochip in a predetermined pattern thereby providing spot locations thereon; and

writing into a storage medium of the biochip information of the spot locations, identity of the biopolymers, and an amount of the biopolymers spotted on each of said spot locations [to the storage medium and associating it with the information of biopolymers spotted on the spot locations].

27. [A] The method [of using a biochip manufactured] according to claim [1]8, [comprising the steps:

applying a sample to the biochip;]

wherein in the applying step, [detecting a spot location where] hybridization occurs between the sample and biopolymers spotted on the biochip to provide the biopolymers bound with the sample [of a biopolymer has occurred;

searching the storage medium for information on the biopolymer that has hybridized, the search being based on information about the spot location where hybridization has occurred; and

displaying the information on the biopolymer that has hybridized].

28. The biochip according to claim 1, further comprising a looped antenna, wherein the storage medium is [a IC] an integrated circuit memory connected to the looped antenna, the storage medium thereby being capable of reading/writing information in a non-contact state.